CLAIMS

We claim:

1. A process for releasing adenosine triphosphate (ATP) from living cells in an aqueous mixture of a polymer or pigment, comprising: agitating said aqueous mixture in the presence of a particulate disruption agent sufficient to cause rupturing of and thereby release ATP from said living cells.

2. The process according to claim 1 in which said living cells comprises one or more of: prokaryotic cells, eukaryotic cells, plant cells, animal cells, protoplast, spheroplasts, spores, yeasts, fungi, mold, or mycobacteria.

3. The process according to claim 2 in which said living cells comprise one or more microorganisms from the genus *Bacillus sp., Lactobacillus sp., Citrobacter sp., Serratia sp., Pseudomonas sp., Burkholderia sp., Alcaligenes sp., Enterobacter sp., Escherichia sp., Klebsiella sp., Proteus sp., Staphylocccus sp., Micrococcus sp., Streptococcus sp., Sarcina sp., Alcaligenes sp., Clostridium sp., Bacteroides sp.*; *Phoma glomerata, Aureobasidium sp., Stemphylium sp., Alternaria sp., Aspergillus sp., Botryodiplodia sp., Botrytis sp., Cladosporium sp., Cephalosporium sp., Fusarium sp., Helminthosporium sp., Paeeilomyces sp., Rhizopus sp., Penicillium sp., Candida sp., Geotichum sp.*, or *Saccharomyces sp.*

4. The process according to claim 3 in which said living cells comprise one or more of: *Bacillus subtilis, Pseudomonas aeruginosa, Burkholderia cepacia, Staphylocccus aureus, Aureobasidium pullulans, Alternaria alternata, Aspergillus niger, Penicillium chrysogenum,* or *Candida albicans.*

5. The process according to claim 4 in which said pigment comprises one or more of: titanium dioxide, barium sulfate, copper sulfate, barium chloride, copper chloride, zinc oxide, zinc sulfide, lead carbonate, calcium carbonate, antimony oxide, clay, copper phthalocyanines, red iron oxide, or an organic pigment.

6. The process according to claim 4 in which said polymer comprises one or more of: a vinyl polymer, a polyester, a polyamide, a polycarbonate, a polysilane, a polyacrylonitrile, a polyolefin, a polyether, a polyurethane, or a cellulosic.

7. The process according to claim 6 in which said polymer comprises one or more sulfonated polyesters, vinyl ester polymers, or acrylic polymers.

8. The process according to claim 7 in which said aqueous mixture comprises an aqueous dispersion of a polyester, an acrylic, an alkyd, or a uralkyd.

9. The process according to claim 8 in which said aqueous mixture comprises one or more components of a coating, an adhesive, a cosmetic, an ink, or a polish.

10. The process according to claim 9 in which said disruption agent comprises one or more metals, metal oxides, silicon oxide, carborundum, ceramic, glass, plastic, or sand.

11. The process according to claim 10 in which said disruption agent is round or oval shaped.

12. The process according to claim 11 in which said disruption agent comprises glass beads having an average diameter of about 0.1 to about 1 millimeter (mm).

13. The process according to claim 12 in which said disruption agent comprises glass beads having an average diameter of about 0.1 to about 0.5 mm.

14. The process according to claim 11 in which said disruption agent comprises a mixture of one or more sets of glass beads having different average diameters.

15. The process according to 14 in which said particulate disruption agent comprises a set of glass beads having an average diameter of about 0.1 mm and a set of glass bead having an average diameter of about 0.5 mm.

16. The process according to claim 15 in which said agitation is carried out using a bead mill operated at about 100 to about 10,000 oscillations per minute for a period of about 0.1 to about 5 minutes.

17. The process according to claim 16 in which said bead mill is operated at about 2000 to about 6,000 oscillations per minute for a period of about 1 to about 3 minutes.

18. A process for releasing ATP from living cells in an aqueous mixture of a polymer, comprising: agitating said aqueous mixture in the presence of a particulate disruption agent comprising glass beads, metal beads, plastic beads, ceramic beads, metal oxide beads, or sand, at an oscillation rate of about 2000 to 6000 oscillations per minute for about 1 to about 5 minutes thereby releasing said ATP from said living cells, in which said polymer comprises one or more sulfonated polyesters, vinyl ester polymers, or acrylic polymers.

19. The process according to claim 18 in which said disruption agent comprises glass beads having an average diameter of about 0.1 to about 0.5 mm.

20. The process according to claim 18 in which said disruption agent comprises a mixture of one or more sets of glass beads having different average diameters.

21. The process according to 20 in which said particulate disruption agent comprises a set of glass beads having an average diameter of about 0.1 mm and a set of glass beads having an average diameter of about 0.5 mm.

22. The process according to claim 21 in which said agitation is carried out using a bead mill operated at about 3000 to about 5,000 oscillations per minute for a period of about 1 to about 3 minutes.

23. A process for detecting living cells in an aqueous mixture of a polymer or pigment, comprising: (i) agitating said aqueous mixture in the presence of a particulate disruption agent sufficient to cause rupturing of and release of ATP from said living cells; and (ii) detecting said ATP released in step (i).

24. The process according to claim 23 in which said aqueous mixture comprises an aqueous dispersion or solution of one or more sulfonated polyesters, viny ester polymers, or acrylic polymers.

25. The process according to claim 24 in which said disruption agent comprises glass beads having an average diameter of about 0.1 to about 1 mm and said agitation is carried out using a bead mill operated at about 2000 to about 6000 oscillations per minute for a period of about 1 to about 5 minutes.

26. The process according to claim 25 in which said particulate disruption agent comprises a mixture of one or more sets of glass beads having different average diameters.

27. The process according to 26 in which said particulate disruption agent comprises a set of glass beads having an average diameter of about 0.1 mm and a set of glass beads having an average diameter of about 0.5 mm.

28. The process according to claim 27 in which said living cells comprise one or more of: prokaryotic cells, eukaryotic cells, plant cells, protoplasts, spheroplasts, spores, yeasts, fungi, mold, or mycobacteria.

29. The process according to claim 28 in which said detection of said ATP comprises a from luciferin/luciferase ATP assay.

30. A process for detecting living cells in an aqueous mixture of a polymer, comprising: (i) agitating said aqueous mixture with a bead mill operated at about 2000 to about 6000 oscillations per minute for a period of about 1 to about 5

minutes in the presence of glass beads having an average diameter of about 0.1 to about 0.5 mm; (ii) contacting said agitated aqueous mixture from step (i) with a luciferin/luciferase reagent to cause a release of photons; and (iii) measuring the photons released in step(ii); in which said polymer comprises comprises one or more sulfonated polyesters, vinyl ester polymers, or acrylic polymers.

31. A process for detecting living cells in an aqueous mixture of a polymer or pigment, comprising: (i) agitating said aqueous mixture in a disruption container with a bead mill in the presence of a particulate disruption agent; (ii) withdrawing a sample of said agitated mixture from step (i) with a sampling device comprising a handle and an adsorbent tip; (iii) inserting said sampling device into an assay container comprising therein a bioluminescent reagent retained by a frangible membrane; (iv) breaking said frangible membrane with said sampling device thereby contacting said sample from step (ii) with a bioluminescent reagent to cause a release of photons; and (v) detecting the photons released in step(iv).

32. The process according to claim 31 further comprising a kit comprising:
   i. a disruption container comprising a disruption agent therein;
   ii. a sampling device comprising a handle and an adsorbent tip; and
   iii. an assay container comprising therein a bioluminescent reagent retained by a frangible membrane.

33. A process for detecting living cells in an aqueous mixture of a polymer or pigment, comprising: (i) agitating said aqueous mixture in a disruption container comprising a particulate disruption agent therein; (ii) attaching to said disruption container a reagent container comprising a bioluminescent reagent therein; (iii) contacting said aqueous mixture with said bioluminescent reagent to cause a release of photons; and (iv) detecting the photons released in step(iii).

34. The process according to claim 33 further comprising a kit comprising: a disruption container comprising a particulate disruption agent therein; and a reagent container comprising a bioluminescent reagent therein.

35. The process according to claim 34 in which said polymer comprises one or more sulfonated polyesters, vinyl ester polymers, or acrylic polymers.

36. A kit for detecting living cells in an aqueous mixture of a polymer or pigment, comprising:

i. a disruption container comprising a disruption agent therein;

ii. a sampling device comprising a handle and an adsorbent tip; and

iii an assay container comprising therein a bioluminescent reagent retained by a frangible membrane.

37. A a kit for detecting living cells in an aqueous mixture of a polymer or pigment, comprising a disruption container comprising a particulate disruption agent therein; and a reagent container comprising a bioluminescent reagent therein.

38. The process according to claim 37 in which said particulate disruption agent comprises a mixture of one or more sets of glass beads having different average diameters.

39. The process according to 38 in which said particulate disruption agent comprises a set of glass beads having an average diameter of about 0.1 mm and a set of glass bead having an average diameter of about 0.5 mm.

40. The kit according to claim 39 in which said bioluminescent reagent comprises lluciferase.